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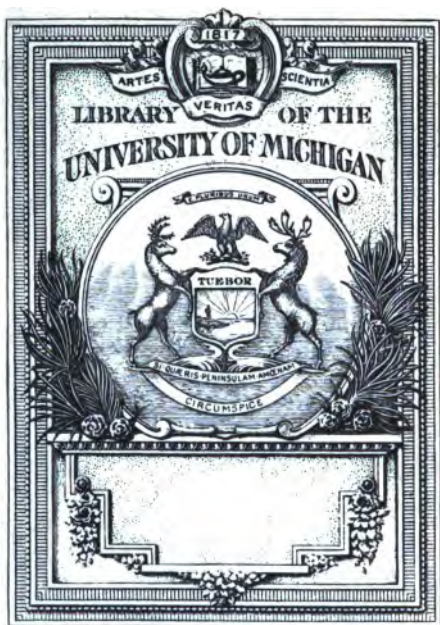
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J. May.

QA
103
.D251

Davies, 2d. ed. 1846

KEY

TO

DAVIES' UNIVERSITY ARITHMETIC:

FOR

THE USE OF TEACHERS ONLY.

NEW YORK:

PUBLISHED BY A. S. BARNES & CO.,

No. 51 JOHN STREET.

1846.



Entered according to Act of Congress, in the year 1846,
By CHARLES DAVIES,
In the Clerk's Office of the District Court of the United States for the Southern
District of New York.

Stereotyped by
RICHARD C. VALENTINE,
New York.

C. A. ALVORD, Printer,
Corner of John and Dutch streets.

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NOTE.

THE large figures at the top of each page show the pages of the Arithmetic on which the examples are found. The titles of subjects and the numbered articles correspond to the Arithmetic, and the answer to each example is numbered the same as the example.

5-8-45 ADE

DAVIES'

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KEY.

REDUCTION.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
2.	$\left\{ \begin{array}{l} 1155s. \\ 13860d. \\ 55440far. \end{array} \right.$	15.	$\left\{ \begin{array}{l} 2410 cr. \\ £602 10s. \end{array} \right.$
3.	52405 <i>far.</i>	16.	$\left\{ \begin{array}{l} 25920s. \\ 5184cr. \\ £1296. \end{array} \right.$
4.	37245 <i>hf. d.</i>	17.	100320 <i>gr.</i>
5.	22736 <i>d.</i>	18.	14 <i>oz.</i>
6.	5726 <i>two d.</i>	19.	$\left\{ \begin{array}{l} 184800gr. \\ 13200gr. \end{array} \right.$
7.	$\left\{ \begin{array}{l} 2767tr. d. \\ 8301d. \end{array} \right.$	20.	26215 <i>gr.</i>
8.	4343 <i>six d.</i>	21.	122 <i>lb. 2oz. 18pwt. 9gr.</i>
9.	$\left\{ \begin{array}{l} 216cr. \\ 432hf. cr. \\ 1080s. \\ 2160six d. \\ 12960d. \\ 51840far. \end{array} \right.$	22.	60 <i>lb. 11oz. 15pwt. 22gr.</i>
10.	$\left\{ \begin{array}{l} 1493s. \\ 5975tr. d. \\ 71700far. \end{array} \right.$	23.	$\left\{ \begin{array}{l} 300\frac{2}{3} \\ 24003 \\ 7200\textcircled{3} \\ 144000gr. \end{array} \right.$
11.	$\left\{ \begin{array}{l} 2880d. \\ 240s. \\ £12. \end{array} \right.$	24.	157 <i>lb 7\frac{2}{3} 43.</i>
12.	£74 10 <i>s.</i>	25.	86962 <i>gr.</i>
13.	99 <i>gu. 4s. 4d.</i>	26.	30 <i>lb 4\frac{2}{3} 33 2 \textcircled{3} 7gr.</i>
14.	£105.	27.	97307 <i>gr.</i>
		28.	26880 <i>lb.</i>
		29.	14 <i>T.</i>
		30.	42292 <i>lb.</i>
		31.	20 <i>T. 13cwt. 1qr. 22lb. 4oz.</i>

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
32.	358398oz.	48.	93A. 2R. 16P.
33.	{ 403T. 19cwt. 1qr. 24lb. 6oz. 231654496dr.	49.	818M. 162A. 3R. 23P.
34.	5024na.	50.	1935360S. in.
35.	864yds.	51.	19840S. ft.
36.	78E. E. 1qr.	52.	3760128S. in.
37.	{ 1197E. E. 23940na.	53.	440cords.
38.	{ 9996yd. 7996E. E. 1yd. 6664E. Fr.	54.	43742cords 32S. ft.
39.	{ 3768fur. 150720rd.	55.	8064qts.
40.	70mi.	56.	13tuns.
41.	{ 88000yd. 264000ft. 3168000in. 9504000bar.	57.	37800pt.
42.	200613ft. 6in.	58.	970½hf. ank.
43.	{ 4755801600bar. 1172qrs. 4bu. 1gal. 3184bar. over.	59.	85248gi.
44.	12374P.	60.	42336pt.
45.	108A.	61.	32832pt.
46.	2214262sq. ft. 72sq. in.	62.	297216hf. pt.
47.	2800P.	63.	1800gal.
		64.	1408pk.
		65.	12lasts.
		66.	1240sacks.
		67.	31557600sec.
		68.	189733554sec.
		69.	{ 240yr. 10da. 4hr. 28m. 38sec.
		70.	588wk.

ADDITION.

4.	787676921.	9.	6001001250561.
5.	10570011.	10.	6000037684799.
6.	15371781930.	11.	128738075326.
7.	45105211.	12.	21890459447.
8.	4002004606555.	13.	1468854008365.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
14.	1819857171437.	47.	403A. 1R. 1P.
15.	\$108,892.	48.	5031A. 3R. 5P.
16.	\$1057,87.	49.	3209tun. 0hhd. 27gal.
17.	\$800,076.	50.	5422pun. 57gal. 2qt.
18.	\$16208,677.	51.	460tier. 29gal. 1qt.
19.	\$5498,043.	52.	297gal. 2qt.
20.	\$67476,840.	53.	249bar. 1fir. 6gal.
21.	£684 5s. 7d.	54.	323bar. 1fir. 4gal.
22.	£205 3s. 10d.	55.	3150hhd. 16gal. 1qt.
23.	£223 12s. 5½d.	56.	5220hhd. 4gal. 2qt.
24.	£240 6s. 8¾d.	57.	528L. ch. 13bu. 2pk.
25.	2382lb. 1oz. 16pwt.	58.	3199Ways 4qr. 7bu.
26.	344lb. 1oz. 19pwt. 20gr.	59.	3842qr. 6bu. 2pk.
27.	462lb. 9oz. 14pwt.	60.	409Scows 12L. ch. 19bu.
28.	407oz. 14pwt. 5gr.	61.	4299yr. 7 ⁸⁷ / ₁₁₂ mo. 2wk.
29.	511lb 11½ 33.	62.	525mo. 0wk. 4da.
30.	294lb 0½ 73.	63.	1127da. 2hr. 50m.
31.	36lb 5½ 63 1½ 18gr.	64.	4444hr. 23m. 50sec.
32.	464lb 0½ 53.		
33.	3203T. 7cwt. 1qr.		
34.	3030cwt. 1qr. 27lb.		
35.	92cwt. 2qr. 15lb. 10oz.		
36.	347lb. 7oz. 6dr.		
37.	471yd. 2qr. 1na.		
38.	484E. E. 2qr.		
39.	3821E. Fr.		
40.	4768E. Fl. 0qr. 2na.		
41.	489L. 1mi. 6fur.		
42.	4487fur. 35rd. 5yd.		
43.	4708rd. 1yd.		
44.	644ft. 0in. 1bar.		
45.	509A. 2R. 18P.		
46.	4797A. 2R. 11P.		

APPLICATIONS.

1.	1605260acres.
2.	{ 1st 3 yrs. 42390529A. last " 4530902A.
3.	\$2051423,77.
4.	£52000.
5.	{ 15995942 coins. \$5668663 = value.
6.	{ Imports, \$303955539. Exports, \$287820350.
7.	1287462.
8.	3617900.
9.	4851875415francs.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
	{ 29884 to Br. N. Amer.	17.	1104087.
10.	{ 66770 to U. S.		{ In 1790, 3924829.
	{ 96654 entire number.		{ 1800, 5305941.
11.	138500tons.		{ 1810, 7265579.
12.	231771men.	18.	{ 1820, 9638191.
13.	\$70560.		{ 1830, 12861192.
	{ 681 No. of vessels.		{ 1840, 17063850.
14.	{ 403 sail vessels.		{ In 1790, 607897.
	{ 144 steam vessels.		{ 1800, 893041.
15.	{ \$ 977911 of gold.	19.	{ 1810, 1191359.
	{ 1567420 of silver.		{ 1820, 1627428.
	{ 2545331 entire sum.		{ 1830, 1998318.
16.	1242792673acres.		{ 1840, 2487355.

SUBTRACTION.

1.	81328.	19.	79 th 10 ³ 63.
2.	7559.	20.	12 ³ 43 29.
3.	£7 18s. 9 ⁴ d.	21.	133 09 15gr.
4.	33891899020240993.	22.	8 th 10 ³ 73.
5.	4539600909999999.	23.	12T. 17cwt. 3qr.
6.	509972609093220149.	24.	2cwt. 2qr. 26lb.
7.	149299788316514071.	25.	17cwt. 1qr. 2lb. 14oz.
8.	\$179,577.	26.	134lb. 14oz. 13dr.
9.	\$79,324.	27.	134yds. 2qr. 3na.
10.	\$9,07.	28.	124E. E. 3qr. 3na.
11.	\$999,955.	29.	96E. Fr. 2qr. 1na.
12.	\$107,576.	30.	1E. El. 1qr. 2na.
13.	\$566,034.	31.	17L. 2mi. 6fur.
14.	\$985,997.	32.	34rd. 4yd.
15.	3lb. 0oz. 15pwt.	33.	4rd. 3 ¹ / ₂ yd. 2ft.
16.	9oz. 17pwt. 20gr.	34.	3ft. 0in. 1bar.
17.	15lb. 3oz. 16pwt.	35.	10A. 2R. 18P.
18.	2oz. 18pwt. 21gr.	36.	37A. 2R. 34P.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
37.	1A. 1R. 26P.	51.	2yr. 11 $\frac{1}{2}$ mo. 3wk.
38.	4A. 2R. 39P.	52.	127mo. 3wk. 6da.
39.	7tun 2hhd. 55gal.	53.	147da. 21hr. 56min.
40.	67pun. 14gal. 3qt.	54.	52hr. 50min. 54sec.
41.	1tier. 1gal. 3qt.		
42.	7gal. 2qt. 1pt.		PROMISCUOUS EXAMPLES.
43.	1bar. 3fir. 7gal.	55.	£3 9s.
44.	107bar. 1fir. 4gal.	56.	£121 17s. 0 $\frac{1}{4}$ d.
45.	221hhd. 7gal. 3qt.	57.	£980 2s. 1d.
46.	63hhd. 2gal. 3qt.	58.	180T. 11cwt. 12lb.
47.	27L. ch. 0bu. 1pk.	59.	{ 5yr. 11 $\frac{1}{2}$ mo. 2wk. 6da. 9hr. 22min.
48.	2Ways 4qr. 2bu.	60.	{ 34° 35' = dif. of lat. 165° 18' = " " long.
49.	52qr. 6bu. 3pk.		
50.	32Scows 1L. ch. 13bu.		
	{ Newton's age was 84yr. 2mo. 26da.		
	{ Euler's " " 76yr. 4mb. 22da.		
	{ Lagrange's " " 77yr. 2mo. 11da.		
	{ Laplace's " " 78yr. 4da.		
61.	{ From Newton's death to Jan. 1st,		
	{ 1846, was - - - 118yr. 9mo. 12da.		
	{ " Euler's " " " 62yr. 3mo. 24da.		
	{ " Lagrange's " " " 32yr. 8mo. 21da.		
	{ " Laplace's " " " 18yr. 9mo. 5da.		
62.	3279hhd.	67.	£5742078.
63.	{ 937215 diff.	68.	\$52315291.
	{ 2428921 pop. of state.	69.	\$2458211.
64.	{ 13277872 diff.	70.	\$6844816.
	{ 18535786 whole pop.	71.	\$49282,03.
65.	\$85864,50.	72.	\$3466051,78.
66.	\$92449341,16.		

*Ex.**Ans.*

73.	From the founding of St. Augustine,	280yr.	6mo.	9da.
	" " " Jamestown,	238yr.	10mo.	4da.
	" " Battle of Princeton,	69yr.	2mo.	14da.
	" " Surrender of Cornwallis,	64yr.	4mo.	28da.
	" Washington's Inauguration,	56yr.	10mo.	17da.
	" Washington's Death,	46yr.	3mo.	3da.
	" the French Berlin Decree,	39yr.	3mo.	26da.
	" " Orders in Council,	38yr.	4mo.	6da.
	" " Declaration of War,	33yr.	8mo.	29da.
	" " Capture of the Guerriere,	33yr.	6mo.	29da.
	" " " " " Macedonian,	33yr.	4mo.	22da.
	" " " " " York,	32yr.	10mo.	20da.
	" " " " " Fort George,	32yr.	9mo.	21da.
	" " Defeat at Sackett's Harbor,	32yr.	9mo.	20da.
	" " Battle of Lake Erie,	32yr.	6mo.	7da.
	" " Battle of Chippewa,	31yr.	8mo.	12da.
	" " " of Niagara,	31yr.	7mo.	23da.
	" " Sortie from Fort Erie,	31yr.	6mo.	
	" " Battle of New Orleans,	31yr.	2mo.	9da.
	" " Death of Adams and Jefferson,	19yr.	8mo.	13da.
	" " Compromise Bill,	13yr.	1mo.	5da.
	" " Death of Lafayette,	12yr.	9mo.	28da.
	" " Removal of the Cherokees,	7yr.	9mo.	22da.

MULTIPLICATION.

1.	6776368.	9.	2324684880333.
2.	68653214.	10.	71109696492112.
3.	4563272.	11.	90012355857332.
4.	1301922.	19.	12935936.
6.	320021195962.	20.	13729103000000.
7.	556321146764.	21.	664763206000000.
8.	1747125213301.	22.	87992382296000000.
23.			2526426017908695000000.
24.			1093689368445084378777040.
25.			16714410677359581583737.

<i>Ex.</i>		<i>Ans.</i>
26.		8371562339213807802080112.
27.		72058988008174745973090826.
28.		95666032459647278072171264.
29.	4896.	
30.	234048.	
31.	4482566.	
32.	314986464.	
		<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">17.</div> <div style="border-left: 1px solid black; padding-left: 10px;"> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">4340,70</div> <div style="margin-right: 10px;">3137,50</div> <div style="margin-right: 10px;">871,75</div> <div style="margin-right: 10px;">7867,50</div> <div style="margin-right: 10px;">2626,56</div> <div style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">\$18844,01</div> </div> </div> </div>

ART. 67.

1.	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">\$70,840.</div> <div style="border-left: 1px solid black; padding-left: 10px;"> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">85,008.</div> <div style="margin-right: 10px;">99,176.</div> </div> </div> </div>	18.	£81 6s. 10d.
2.	\$7834,14.	19.	24 T. 7cwt. 3qr. 27lb. 8oz.
3.	\$12517,68.	20.	152yd. 9in.
4.	\$77079,456.	21.	£1 10s. 2d.
5.	\$98,80.	22.	£1 9s. 2d.
6.	\$341,25.	23.	£2 0s. 6d.
7.	\$98,94.	24.	£2 1s. 8½d.
8.	\$813,020.	25.	£3 2s. 8d.
9.	\$5869,75.	26.	£2 19s. 6d.
10.	\$2539,53.	27.	£8 3s. 9d.
11.	\$2426,15.	28.	£16 8s. 7½d.
12.	\$15169,50.	29.	£22 13s.
13.	\$162,25.	30.	133yd. 3qr. 2na.
14.	\$21935,214.	31.	11lb. 6oz. 9pwt. 12gr.
15.	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">15,30</div> <div style="border-left: 1px solid black; padding-left: 10px;"> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">5,425</div> <div style="margin-right: 10px;">17,82</div> <div style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">\$38,545</div> </div> </div> </div>	32.	197yd. 1qr. 1na.
		33.	£3 19s. 4½d.
		34.	£66 19s. 6d.
		35.	£8 19s.
		36.	£65 19s. 9½d.
		37.	£208 13s. 9d.
		38.	£154 12s. 3d.
16.	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">4,56</div> <div style="border-left: 1px solid black; padding-left: 10px;"> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">102,06</div> <div style="margin-right: 10px;">114,00</div> <div style="margin-right: 10px;">743,04</div> <div style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">\$963,66</div> </div> </div> </div>	39.	£42 1s. 6d.
		40.	£123 17s. 9d.
		41.	£819 6s.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
42.	690lb. 8oz. 18pwt. 16gr.	66.	£17038 10s. 11d. $2\frac{1}{2}$ far.
43.	75A. 3R. 39P.	67.	£12422 2s. 7d. $2\frac{6}{7}$ far.
45.	£19 10s. $8\frac{3}{4}$ d.	68.	£2875 0s. $7\frac{1}{2}$ d.
46.	£32 14s. $0\frac{3}{4}$ d.	69.	£1292 1s. 6d. $3\frac{1}{2}$ far.
47.	£33 3s. $1\frac{3}{4}$ d.	70.	£658 0s. 11d. $1\frac{3}{4}$ far.
48.	£83 2s. 8d.		
49.	£137 7s. 3d.		
50.	£698 2s.		
51.	743mo. 15da. 6hr.		
52.	222cwt. 18lb.	71.	
53.	15cwt. 27lb. 11oz. 7dr.		
55.	£2687 18s. 3d.		
56.	£351 2s. $7\frac{1}{2}$ d.		
57.	£257 12s. 4d.		
58.	£62 1s. $7\frac{1}{2}$ d.		
59.	£15299 18s. 4d.		
60.	£51 7s. $2\frac{1}{2}$ d.	72.	
61.	£344 0s. 6d.		
62.	£1438 8s.		
65.	£566 5s. $3\frac{1}{2}$ d.		

£	s.	d.
3	17	6
10	12	8
8	16	$5\frac{3}{4}$
11	8	$4\frac{1}{2}$
13	2	$0\frac{1}{2}$
2	15	$8\frac{1}{4}$
£50	12	9

s.	d.	far.
6	5	$3\frac{3}{4}$
9	0	$3\frac{1}{2}$
14	0	3
7	8	$1\frac{3}{4}$
7	5	$1\frac{1}{2}$
5	5	$1\frac{1}{4}$
£2	10	$2\frac{3}{4}$

DIVISION.

2.	4072941 ⁰⁸⁰ ₁₇₅₄	10.	3003355752 ⁷³¹¹³ ₈₇₁₀₀₇
3.	131951331 ⁸⁴² ₃₅₇₄	11.	9948157977 ⁸¹⁶⁰⁵ ₆₇₈₉₅₇
4.	1251392011 ³⁰¹⁰ ₄₈₇₀₈	12.	59085714 ⁸⁴ ₁₂₁
5.	269577255882 ⁵⁵⁶¹ ₁₇₄₉₃	13.	125812715 ⁷⁸⁵ ₈₇₁₄₆
6.	142437577483 ⁵⁴¹¹ ₄₇₁₄₈	14.	123456789.
7.	1539591912214 ³⁷¹⁴⁶	15.	123456789.
8.	30001000 ⁶³⁴⁷ ₅₇₁₄₃	16.	119191753 ⁹⁰¹⁰⁷ ₁₂₃₄₅₆
9.	1318096551 ⁰⁴⁹⁹⁰ ₃₇₄₅₈₇		
17.			9001844424018274624226 ⁵⁴⁸⁴²⁴ ₈₈₇₈₇₅

ART. 79.		Ex.	Ans.
Ex.	Ans.	6.	8905748 ⁷²²⁹³⁴ ₇₅₄₀₀₀₀ .
1.	132.	7.	1421076222 ⁴²⁷¹⁵ ₇₅₄₀₀₀₀ .
2.	4871000.	8.	93191497743 ⁹⁵²⁵⁷ ₁₅₇₉₀₀₀ .
3.	718328.	9.	4087692937 ³⁸¹⁷¹⁵ ₁₇₄₉₀₀₀₀ .
4.	7128368.	10.	7943859 ³² ₈₀ .
5.	918546.	11.	1190921 ²³⁴⁸ ₁₄₄₀₀ .
		12.	71400714374.
		13.	937143718740.
		14.	1924530 ⁶⁵²⁵⁴⁷ ₃₇₁₄₉₀₀₀ .
ART. 80.		EXAMPLES IN DENOMINATE NUMBERS.	
2.	387.		
3.	133.		
4.	201.		
ART. 81.			
3.	17085 ²⁹ ₅₈ .	2.	£15 19s. 9d. 1 ¹ ₂ far.
4.	67639 ²¹ ₇₂ .	3.	£1 11s. 5d. 1 ¹ ₂ far.
5.	6129 ¹¹ ₁₁₀ .	4.	15s. 1d. 3 ¹ ₈ far.
6.	3095 ⁸⁷ ₁₄₄ .	5.	4s. 7d. 3 ¹ ₁₄₀ far.
8.	272202735 ¹² ₁₂ .	6.	£9 18s. 3d. 3 ²² ₁₇₀ far.
9.	5203802 ⁶¹ ₁₄₄ .	7.	9yd. 2qr. 1 ¹ ₂ na.
10.	11805558 ⁵² ₅₂ .	8.	{ 37A. 32P. 20sq. yd. 1sq. ft. 72sq. in.
11.	39096821 ⁶⁴ ₁₂₁ .	9.	8lb. 7pwt. 15 ⁴⁵ ₈₀ gr.
12.	34297219 ⁶² ₁₀₈ .	10.	7cwt. 3qr. 6lb. 10oz.
13.	356851291 ²⁶ ₁₃₂ .	11.	2E. E. 3qr. 1 ¹⁰⁷ ₁₄₂ na.
14.	108236371 ¹² ₈₈ .	12.	£1 17s. 6d.
15.	6502 ⁴⁸ ₇₂₀ .	13.	6d. 1 ¹⁶ ₁₁₂ far.
16.	206190192477 ⁴⁴³⁶⁰⁴⁶⁹⁰ ₄₇₉₀₀₀₁₆₀₀ .	14.	17s. 11 ³ ₄ d.
		15.	2s. 4d.
		16.	£40 10s. 6d.
		17.	1s. 9d.
		18.	10 ³ ₄ d.
		19.	4s. 9 ³⁶ ₂₅₂ d.
		20.	5 guineas 11s. 8d.
ART. 82.			
2.	15655794 ⁹⁰⁷⁵ ₃₈₅₀₀₀ .		
3.	2667376 ⁴²⁷⁰⁰ ₇₃₀₀₀₀ .		
4.	16871651 ²⁹⁴⁴ ₄₇₁₅₀ .		
5.	47462565 ⁹⁶⁴⁹ ₃₁₅₀₀ .		

<i>Ex.</i>		<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
21.	10oz. 15pwt. 14 $\frac{88}{125}$ gr.		6.	20—37868 rem.
22.	{ 17cwt. 2qr. 11lb. 14oz. { 13 $\frac{1}{2}$ dr.		7.	\$2160348,262+.
23.	39E. Fl. 1qr. 3na. 1 $\frac{1}{2}$ in.		8.	{ \$1,255+. { \$1,244+.
APPLICATIONS.			9.	\$25141072,267+.
			10.	\$0,06+.
1.	21T. 10cwt. 2qr. 6 $\frac{3}{4}$ lb.		11.	\$166743,259+.
2.		\$5,262+.	12.	63—225927 rem.
3.		\$73,296+.	13.	37—2588 rem.
4.		\$0,0899+.	14.	38—190 rem.
5.		\$1,283+.	15.	\$334477,744+.

PROPERTIES OF THE 9's.

ART. 85.			3.	177234141—3.
1.		2. 7.		
2.		7. 3.		ART. 87.
3.		1. 7.	2.	{ 503602—7. { Excess in minuend, 7
ART. 86.			3.	{ 45991735—7. { Excess in minuend, 8.
2.	140487982—7.			

VULGAR FRACTIONS.

ART. 98.		ART. 99.	
1.	$\frac{35}{8}$.	1.	$\frac{4}{17}$.
2.	$\frac{21}{11}$.	2.	$\frac{14}{258}$.
3.	$\frac{162}{13}$.	3.	$\frac{22}{741}$.
4.	$\frac{132}{17}$.	4.	$\frac{21}{438}$.
5.	$\frac{17}{18}$.	5.	$\frac{16}{128}$.
6.	$\frac{108}{17}$.	6.	$\frac{39}{147}$.
7.	$\frac{126}{11}$.	7.	$\frac{8}{127}$.
8.	$\frac{195}{27}$.	8.	$\frac{9}{292}$.

ART. 100.

<i>Ex.</i>	<i>Ans.</i>
1.	$\frac{67}{282}$
2.	$\frac{34}{783}$
3.	$\frac{127}{4188}$
4.	$\frac{327}{4981}$
5.	$\frac{327}{5684}$
6.	$\frac{1249}{4816}$
7.	$\frac{327}{1825}$
8.	$\frac{94}{3896}$

ART. 101.

<i>Ex.</i>	<i>Ans.</i>
1.	$\frac{3}{2}, 3.$
2.	$\frac{16}{8}, \frac{16}{4}, \frac{16}{2}.$
3.	$\frac{34}{24}, \frac{34}{16}, \frac{34}{8}.$
4.	$\frac{147}{7}, \frac{147}{2}.$
5.	$\frac{127}{7}.$
6.	$\frac{151}{40}, \frac{151}{20}, \frac{151}{10}.$
7.	$\frac{246}{47}, \frac{246}{21}.$
8.	$\frac{449}{12}, \frac{449}{4}.$

ART. 102.

2.	$\frac{51}{87}, \frac{68}{78}, \frac{102}{114}, \frac{119}{133}, \frac{153}{171}, \frac{255}{285}, \frac{289}{323}.$
3.	$\frac{117}{153}, \frac{156}{204}, \frac{208}{272}, \frac{91}{119}, \frac{65}{85}, \frac{143}{187}.$

ART. 103.

3.	$\frac{16}{64}, \frac{8}{32}, \frac{4}{16}, \frac{2}{8}, \frac{1}{4}.$
4.	$\frac{30}{90}, \frac{20}{60}, \frac{15}{45}, \frac{12}{36}, \frac{10}{30}, \frac{6}{18}, \frac{5}{15}, \frac{4}{12}, \frac{3}{9}, \frac{2}{6}, \frac{1}{3}.$

GREATEST COMMON DIVISOR.

1.	4.
2.	45.
3.	630.
4.	267.
5.	396.
6.	12.
7.	8.
8.	4.
9.	3.
10.	17.

2D METHOD.

ART. 105.

2.	43, 3, 5.
3.	3, 3, 2, 2, 2, 5.

ART. 106.

2.	3.
3.	25.
4.	57.
5.	15

LEAST COMMON MULTIPLE.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
3.	840.	11.	74613.
4.	147.		
5.	840.		
6.	196.		
7.	78.		
8.	84.		
9.	1008.		
10.	156.		

2D METHOD.

3.	1260.
4.	7200.
5.	2520.
6.	1008.
7.	10500.
8.	10800.

REDUCTION OF VULGAR FRACTIONS.

ART. 110.

2.	$12\frac{3}{8}$.	6.	$1351\frac{187}{200}$.
3.	$2\frac{5}{7}yd.$	7.	$282\frac{78}{151}$.
4.	$5\frac{8}{9}bu.$	8.	$134\frac{6}{9}$.
5.	5.	9.	$372\frac{19}{99}$.
6.	$\left\{ \begin{array}{l} 2\frac{77}{125}, 24, 7\frac{1700}{6041}, \\ 13\frac{47712}{72301}. \end{array} \right.$	10.	$1749383049.$
7.	$2192\frac{1}{4}$.	11.	$459287.$
8.	$1911\frac{5}{2}$.	12.	$16106.$
9.	14.	13.	$77\frac{1}{7} = 78.$
10.	$3763\frac{17}{999}$.		
11.	$10731\frac{55}{349}$.		

ART. 112.

2.	$\frac{1}{3}.$
3.	$\frac{1}{8}.$
4.	$\frac{5}{8}.$
5.	$11\frac{17}{163}.$
6.	$\frac{2}{13}.$
7.	$\frac{7}{8}.$
8.	$\frac{7}{8}.$
9.	$\frac{13}{7}.$
10.	$\frac{4}{7}.$

ART. 111.

3.	$287\frac{1}{2}$.
4.	$\left\{ \begin{array}{l} 34513, 7899, 69047, \\ 51, 99, 100, \\ 38177, \\ 104. \end{array} \right.$
5.	$148261, 91772, 59267822.$
	$178, 104, 879.$

<i>Ex.</i>	<i>Ans.</i>
11.	$\frac{187}{518}$.
12.	$\frac{41}{81}$.
13.	$\frac{69}{348}$.
14.	$\frac{302}{361}$.
15.	$\frac{183}{2387}$.

ART. 113.

2.	$\frac{135}{9}$.
3.	$\frac{24325}{175}$.
4.	$\frac{332497}{181}$.
5.	$\frac{273699, 744093}{837, 837}, \frac{481275}{837}$.
6.	$\frac{14863}{89}$.
7.	$\frac{52258}{17}$.

ART. 114.

2.	$\frac{819}{8}$.
3.	$\frac{15}{7}$.
4.	$\frac{72761}{218}$.

ART. 115.

3.	$\frac{375}{10504}$.
4.	$\frac{1681}{178860}$.
5.	$\frac{3045}{344} = \frac{8293}{344}$.

ART. 116.

2.	$\frac{381}{780}$.
3.	$\frac{81}{198}$.
4.	$\frac{99}{332}$.
5.	$\frac{3454}{7}$.
6.	$\frac{7}{42938}$.
7.	$\frac{33028520}{8389887}$.

ART. 117.

<i>Ex.</i>	<i>Ans.</i>
4.	$\frac{77}{14}, \frac{4}{14}, \frac{56}{14}$.
5.	$\frac{525}{800}, \frac{1080}{800}, \frac{22200}{800}$.
6.	$\frac{209}{50}, \frac{62}{50}, \frac{1550}{50}$.
7.	$\frac{1080}{144}, \frac{248}{144}, \frac{900}{144}$.
8.	$\frac{518}{128}, \frac{1026}{128}, \frac{1575}{128}$.
9.	$\frac{1152}{5760}, \frac{2560}{5760}, \frac{3600}{5760}, \frac{3960}{5760}$.
10.	$\frac{5}{28}, \frac{9}{28}$.
11.	$\left\{ \frac{20664}{4032}, \frac{14976}{4032}, \frac{16576}{4032}, \frac{26712}{4032} \right\}$.
12.	$\frac{126}{210}, \frac{140}{210}, \frac{30}{210}, \frac{105}{210}$.
13.	$\left\{ \frac{2304}{4032}, \frac{2240}{4032}, \frac{1512}{4032}, \frac{3528}{4032}, \frac{76608}{4032} \right\}$.
14.	$\left\{ \frac{1190700}{17860500}, \frac{1701000}{17860500}, \frac{2381400}{17860500}, \frac{47628000}{17860500}, \frac{14288400}{17860500}, \frac{1913625}{17860500}, \frac{19845000}{17860500} \right\}$.

ART. 118.

3.	$\frac{2}{12}, \frac{1}{12}, \frac{9}{12}$.
4.	$\frac{42}{84}, \frac{24}{84}, \frac{24}{84}$.
5.	$\frac{15}{24}, \frac{22}{24}, \frac{18}{24}$.
6.	$\frac{164}{24}, \frac{229}{24}, \frac{127}{24}$.
7.	$\frac{282}{36}, \frac{16}{36}, \frac{9}{36}, \frac{4}{36}$.

ART. 119.

2.	$\frac{36}{48}, \frac{48}{48}, \frac{9}{48}$.
3.	$\frac{122}{8}, \frac{51}{8}, \frac{4}{8}$.
4.	$\frac{72}{360}, \frac{60}{360}, \frac{320}{360}$.
5.	$\frac{67}{120}, \frac{18}{120}, \frac{300}{120}$.
6.	$\frac{32}{100}, \frac{805}{100}, \frac{480}{100}, \frac{300}{100}$.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
7. $\frac{450}{144}, \frac{624}{144}, \frac{1200}{144}, \frac{2079}{144}$		9. $\frac{36}{50}, \frac{80}{50}, \frac{50}{50}, \frac{53}{50}$	
8. $\frac{6}{12}, \frac{8}{12}, \frac{9}{12}, \frac{10}{12}$		10. $\frac{16}{48}, \frac{26}{48}, \frac{40}{48}, \frac{42}{48}, \frac{33}{48}, \frac{34}{48}$	

REDUCTION OF DENOMINATE FRACTIONS.

ART. 121.

3.	$\frac{3}{143360} T.$
4.	$\frac{5}{4536} hhd.$
5.	$\pounds \frac{4}{300}$
6.	$\pounds \frac{1}{2680}$
7.	$\frac{3}{504} hhd.$
8.	$\pounds \frac{1}{32}$
9.	$\frac{187}{182880} da.$
10.	$\frac{3}{448} cwt.$
11.	$\frac{1}{71680} T.$
12.	$\pounds \frac{3}{7}$
13.	$\pounds \frac{1}{336}$
14.	$\frac{1}{288} lb.$
15.	$\frac{1}{140} lb.$
16.	$\frac{11}{819} hhd.$

ART. 122.

2.	64lb.
3.	32d.
4.	480m.
5.	$\frac{480}{9} P.$
6.	$\frac{4760}{7} far.$
7.	$\frac{3}{8} gal.$
8.	$\frac{128}{7} pt.$
9.	$\frac{252200}{7} sec.$

10.	5040gi.
11.	$\frac{2880}{7} far.$
12.	$\frac{1}{4} d.$
13.	$\frac{4}{2} pwt.$
14.	$\frac{4}{7} lb.$
15.	$\frac{4233600}{71} sec.$
16.	$\frac{179200}{9} oz.$
17.	$\frac{224}{7} na.$
18.	$\frac{174240}{23} ft.$
19.	$\frac{2448}{11} \textcircled{3}.$

ART. 123.

2.	9oz. 12pwt.
3.	1qr. 7lb.
4.	2R. 20P.
5.	3s. 4d.
6.	52gal. 2qt.
7.	24gal. 2qt.
8.	4s. 8d.
9.	7oz. 4pwt.
10.	1pi. 1hhd. 31gal. 2qt.
11.	7oz. 4pwt.
12.	1mi. 6fur. 16rd.
13.	1R. 20P.
14.	8yd. 1qr. $1\frac{1}{2} na.$
15.	1pi. 1hhd. 7gal.
16.	29gal. 1qt. $1\frac{1}{7} pt.$
17.	98da. 8Ar. 4m. $36\frac{1}{3} sec.$

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
18.	20bu.	12.	£1 $\frac{21}{40}$.
19.	5s. 4d.	13.	$2\frac{3}{4}$ s.
20.	6cwt. 3qr. 6lb.	14.	$1\frac{1}{2}$ cwt.
21.	10S. ft. 216S. in.	15.	$\frac{751}{1800}$ lb.
22.	30gal. 2 $\frac{6286}{138637}$ qt.	16.	$2\frac{1}{4}$ E. E.
ART. 124.		17.	$11\frac{81}{202}$ yr.
3.	$1\frac{2}{3}$ yd.	18.	£2 $\frac{79}{480}$.
4.	$1\frac{1}{8}$ hhd.	19.	$\frac{1}{4}$ groat.
5.	$\frac{5}{18}$ cwt.	20.	$\frac{4}{7}$ quarter.
6.	$\frac{1}{72}$ hhd.	21.	$\frac{7}{18}$ yd.
7.	$\frac{79}{63380}$ mi.	22.	$1\frac{1}{2}$ A.
8.	$\frac{1}{63380}$ mi.	23.	$3\frac{51}{60}$ Hb.
9.	$2392000\frac{3661}{da}$.	24.	$3\frac{5}{36}$ hhd.
10.	$\frac{61}{480}$ da.	25.	$23\frac{23}{632}$ S. yd.
11.	$\left\{ \begin{array}{l} \frac{61}{660} \text{ of } 2da. \\ \frac{61}{1440} \text{ of } 3da. \\ \frac{61}{1920} \text{ of } 4da. \\ \frac{61}{4800} \text{ of } 10da. \\ \frac{61}{12000} \text{ of } 25da. \end{array} \right.$	26.	$1\frac{1}{44}$ L. ch.
		27.	$\frac{491}{1200}$ °.
		28.	$22\frac{2}{3}$ hhd.

ADDITION OF VULGAR FRACTIONS.

ART. 126.

2.	£2 $\frac{1}{4}$.	2.
3.	$\frac{1}{3}$.	3.
4.	2.	4.
5.	$\frac{4}{7}$.	5.
6.	$\frac{40}{11}$.	6.
		7.

ART. 127.

2.	£4 $\frac{53}{78}$.
3.	$\frac{10194}{943}$.
4.	$\frac{1195}{1008}$.
5.	$\frac{36}{20}$.
6.	$\frac{1302}{80}$.
7.	$\frac{46353}{3080}$.

ART. 128.		<i>Ex.</i>	<i>Ans.</i>
	<i>Ans.</i>	5.	1mi. 3fur. 18rd.
2.	$84\frac{193}{280}$	7.	7fur. 2ft. 9in.
3.	$31\frac{101}{105}$	8.	1cwt. 1qr. 27lb. 13oz.
4.	$4\frac{187}{252}$	9.	11s. $6\frac{23}{42}$ d.
5.	$61\frac{23}{105}$	10.	£3 12s.
6.	$170\frac{53}{140}$	11.	2oz. 10pwt. 12gr.
7.	$8\frac{489}{816}$	12.	9cwt. 1qr. 6lb. 3oz. $8\frac{8}{9}$ dr.
8.	$67\frac{83}{880}$	13.	2E. E. 4qr. $0\frac{3}{4}$ na.
9.	$8\frac{14257091}{39199832}$	14.	3fur. 25rd. 3yd. $2\frac{1}{2}$ in.
		15.	{ 2R. 20P. 11Sq. ft. 58 $\frac{1}{8}$ Sq. in.
		16.	3hhd. 37gal. $3\frac{1}{2}$ qt.
2.	$14\frac{1}{8}$ in. = $\frac{253}{848}$ yd.	17.	20bu. $1\frac{3}{4}$ pk.
3.	2da. $14\frac{1}{2}$ hr.	18.	2da. 2hr. 12m.
4.	2qr. 17lb. 1oz. $3\frac{1}{2}$ d.	19.	55da. 10hr. $8\frac{1}{4}$ m.

SUBTRACTION OF VULGAR FRACTIONS.

ART. 131.			
2.	$\frac{166}{105}$	10.	$75\frac{3}{4}$
3.	$\frac{3281}{5788}$	11.	$\frac{659}{113}$
4.	$\frac{17997}{327}$	12.	$364\frac{4}{15}$
		13.	$47\frac{2}{3}$
		14.	$\frac{1}{10}$
		15.	$9\frac{1}{5}$
		16.	$8\frac{2081}{3980}$
ART. 132.			
2.	$\frac{1}{12}$		
3.	$2\frac{1}{2}$		
4.	$\frac{19}{8}$		
5.	$\frac{1}{32}$		
6.	$\frac{11496}{318}$		
7.	$\frac{2}{80}$		
8.	$\frac{11}{24}$		
9.	$\frac{1117137}{1742910}$		
		ART. 133.	
		2.	11hr. 59m. $59\frac{1}{2}$ sec.
		3.	1lb. 8oz. 16pwt. 16gr.
		4.	16gal. 2qt. 1pt. $3\frac{7}{8}$ gi.
		5.	9s. 3d.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
6.	11pwt. 3gr.	11.	25gal. 1pt. 1½gi.
7.	4cwt. 1qr. 15lb. 1oz. 9¾dr.	12.	1mi. 1fur. 16rd.
8.	14s. 3¾d.	13.	202da. 21hr. 45m. 32¼sec.
9.	9oz. 7pwt. 12gr.	14.	{ Troy oz. 1pwt. 18½gr.
10.	7cwt. 1qr. 27lb. 8oz.		{ greater.

MULTIPLICATION OF VULGAR FRACTIONS.

ART. 135.

2.	3½
3.	6½
4.	33¼
5.	42½
6.	124½
7.	493½
8.	382½
9.	1196½

ART. 136.

3.	7½
4.	8½
5.	5½
6.	10½
7.	20.
8.	2½
9.	14½
10.	2½
11.	9½
12.	540.

13.

11753
4087984.

ART. 137.

3.	608½
4.	5987½
5.	12019½
6.	10622½

GENERAL EXAMPLES.

1.	1½
2.	303 700.
3.	140 8181.
4.	62½
5.	5½
6.	36.
7.	7½
8.	£2 3s. 9d.
9.	45½
10.	8½
11.	267½

DIVISION OF VULGAR FRACTIONS.

ART. 139.		Ex.	Ans.
Ex.	Ans.	11.	$\frac{63}{84}$.
2.	$\frac{2}{37}$.	12.	$9\frac{8}{13}$.
3.	$\frac{1121}{283}$.	13.	$\frac{113}{1440}$.
4.	$\frac{145}{3758}$.	14.	$58\frac{1758}{33341}$.
5.	$\frac{379}{19003}$.	15.	$1\frac{7803}{39356}$.
6.	$\frac{37}{162}$.	16.	21.
7.	$\frac{61}{777}$.	17.	$\frac{5}{1298}$.
ART. 140.		18.	$\frac{56}{363}$.
1.	$\frac{7}{8}$.	19.	$8\frac{8}{21}cts.$
2.	$29\frac{1}{4}$.	20.	$4\frac{4}{40}cts.$
3.	$\frac{119}{18}$.	21.	\$5.25.
4.	$68\frac{877}{7029}$.	22.	$\$2\frac{94}{125}$.
5.	153801.	23.	$15\frac{110}{261}cts.$
6.	$30\frac{1942}{2333}$.	24.	$88\frac{512}{1701}cts.$
7.	$\frac{2}{3}$.	25.	$95\frac{5}{16}cts.$
8.	$7\frac{1}{4}$.	26.	$192\frac{316}{51}$.
9.	$71\frac{91}{182}$.	27.	$\$2\frac{454}{3335}$.
10.	$20\frac{20}{39}$.	28.	$28\frac{472}{2255}$.

DECIMAL FRACTIONS.

ART. 143.		6.	2.00000003.
1.	41.3.	7.	.492.
2.	16.000003.	8.	3000.0021.
3.	5.09.	9.	47.0021.
4.	65.015.	10.	.001503.
5.	80.000003.	11.	39.640.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
12.	300.000840.	5.	\$39.397.
13.	.650.	6.	\$12.003.
14.	50000.04.	7.	\$147.04.
15.	600.0018.	8.	\$148.004.
16.	.000003.	9.	\$4.006.
17.	.00039.	10.	\$14.039.
ART. 144.		11.	\$149.332.
1.	\$17.389.	12.	\$1328.005.
2.	\$92.895.	13.	\$0.904.
3.	\$107.968.	14.	\$0.058.
4.	\$47.25.	15.	\$3856.02.

ADDITION OF DECIMAL FRACTIONS.

1.	1306.1805.	10.	397.547.
2.	528.697893.	11.	31.02464.
3.	159.37.	12.	1.110129.
4.	1.5415.	13.	494.521.
5.	446.0924.	14.	\$641.249.
6.	27.2087.	15.	.111.
7.	88.76257.	16.	4.0006.
8.	71.01.	17.	2.413009.
9.	1835.599.	18.	\$129.761.
		19.	\$1132.365.

SUBTRACTION OF DECIMAL FRACTIONS.

2.	3277.9121.	7.	1571.85.
3.	249.60401.	8.	.6946.
4.	9.888899.	9.	.89575.
5.	51.722.	10.	603.925.
6.	2.7696.	11.	1379.25922.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
12.	99.706.	18.	565.007497.
13.	17.949.	19.	20.9942.
14.	.699993.	20.	260.3608953.
15.	395.9992.	21.	10.030181.
16.	.999.	22.	2.0294.
17.	6373.9.		

MULTIPLICATION OF DECIMAL FRACTIONS.

2.	329.307391.	12.	215.67436625.
3.	742.036196.	13.	.000000000294.
4.	.001000001.	14.	18616.74.
5.	26.99178.	15.	933.8253150762.
6.	10376.283913.	16.	.25.
7.	275539.5065.	17.	.0025.
8.	.020621125.	18.	.00715248.
9.	28033.797099.	19.	.608785264.
10.	175.26788356.	20.	.02860992.
11.	.00043204577.	21.	2.435141056.

CONTRACTION IN MULTIPLICATION.

2.	258.13005.	4.	2757.89785.
3.	162.525.	5.	3566163.

DIVISION OF DECIMAL FRACTIONS.

ART. 152.			
2.	2.22.	7.	{ 25.05068. 250.5068. 2505.068. 25050.68. 250506.8.
3.	8.522.		
4.	33.331.		
5.	1.0001.	8.	{ 48.65961. 4865.961. 48659.61. 486596.1. 4865961.
6.	12420.5.		

Ex.

Ans.

9.

{ 41.622.
416.22.
4162.2.
41622.
416220.
4162200.

10.

{ 254.7347748.
25473.47748.
254734.7748.
2547347.748.
25473477.48.
254734774.8.

11.

.13956+.

12.

1918+.

13.

.00473+.

14.

1.74412.

15.

69.7125.

16.

1.368+.

17.

12976+.

18.

.0049589+.

ART. 154.

2.

10970.

3.

60200.

4.

1000.

5.

100.

6.

{ 10.
100.
1000.
30.
20.
2000
12.
1200.
500000.

ART. 155.

Ex.

Ans.

3.

8.3111+.

4.

1.563+.

5.

1.16+.

ART. 156.

1.

339.513001yd.

2.

155.1011lb.

3.

\$88.141.

4.

\$11055.2925.

5.

\$930.699.

6.

\$140.625.

7.

\$20.87.

8.

\$3731.123.

9.

224.58S. yd.

10.

\$136.203.

11.

\$365.61525.

12.

\$1.35.

13.

{ 269 acres = area.
\$13573.204 = cost.
\$50.458+ = average price.

14.

{ \$7631.8855 = eldest son's share.
\$5723.914125 = share of each of the other sons.

CONTRACTION IN DIVISION.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
2.	79.1188—6 <i>rem.</i>	4.	11.5834036625—6 <i>rem.</i>
3.	35.2843—3 <i>rem.</i>	5.	3202.8870—1 <i>rem.</i>

REDUCTION OF VULGAR FRACTIONS TO DECIMALS.

2.	.125.	.0159+	13.	.4411+.
3.	{ .0125.	.692+.	14.	.2571+.
	{ .003.	.000183+	15.	.8947+.
4.	.5.	.0028+.	16.	.008033+.
5.		1.496+.	17.	.23903+.
6.	{ 1.333+.	.1629+.	18.	.1666+.
	{ .792+.	4.666+.	19.	1.5555+.
7.		.02343+.	20.	.15909+.
8.		.1355+.	21.	\$100.8.
9.		.0003.	22.	\$17.85.
10.		.2224+.	23.	27.409090+.
11.		.000000488+.	24.	1.25.
12.		.8571+.	25.	3.0339+.

REDUCTION OF DENOMINATE DECIMALS.

	ART. 160.	8.	13.0909rd.+.
1.	.0546875lb.	9.	.00396bar.+.
2.	£.325.	10.	1.5yd.
3.	.00035A.	11.	.6625lb.
4.	.029166da.+.	12.	.7282yr+.
5.	3.9375pk.	13.	.1697yr.+.
6.	.375da.	14.	£25.977+.
7.	71.151mi.+.	15.	.9375wt.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
16.	.7391 <i>mi.</i> +.	22.	.104166 <i>ch.</i> +.
17.	.2325 <i>T.</i>	23.	.07472 <i>yr.</i> +.
18.	.1533 <i>T.</i> +.	24.	£.1225.
19.	.7129 <i>da.</i> +.	25.	.26175 <i>A.</i>
		26.	.1005113 <i>mi.</i> +.

ART. 161.

1.	£19.8635 +.
2.	£2.325.
3.	.625 <i>s.</i>
4.	2.46944 <i>lb.</i> +.
5.	2.5 <i>yd.</i>
6.	1.046875 <i>lb.</i>
7.	10.16666 +.
8.	£.3729 +.
9.	£.00625.
10.	£.2325757 +.
11.	.12968 <i>lb.</i> +.
12.	.05 <i>oz.</i>
13.	{ .398763 <i>lb.</i> + <i>troy.</i> (See Arith., Art. 20, p. 23.)
14.	.16875 <i>T.</i>
15.	.633928 <i>cwt.</i> +.
16.	{ .042965 <i>cwt.</i> +. (See Arith., Art. 20, p. 23.)
17.	.3125 <i>yd.</i>
18.	.55 <i>E. E.</i>
19.	.00161773 <i>mi.</i> +.
20.	.48125 <i>A.</i>
21.	.00992 <i>hhd.</i> +.

ART. 162.

1.	2 <i>qr.</i> 14 <i>lb.</i>
2.	2 <i>qt.</i> 1 <i>pt.</i>
3.	1 <i>pwt.</i> +.
4.	20 <i>gal.</i> 1 <i>qt.</i>
5.	136 <i>da.</i> 21 <i>hr.</i>
6.	1 <i>s.</i> 8½ <i>d.</i> +.
7.	1 <i>qr.</i> 14 <i>oz.</i> 5 <i>dr.</i> +.
8.	19 <i>hr.</i> 2 <i>m.</i> 24 <i>sec.</i>
9.	2 <i>mi.</i> 24 <i>rd.</i> 5 <i>yd.</i> 10 <i>in.</i> +.
10.	6 <i>s.</i> 9 <i>d.</i>
11.	6 <i>cwt.</i> 3 <i>qr.</i>
12.	8 <i>P.</i>
13.	1 <i>hhd.</i> 47 <i>gal.</i> 1 <i>qt.</i>
14.	12 <i>dr.</i>
15.	208 <i>da.</i> 3 <i>hr.</i> 23 <i>m.</i> 33 <i>sec.</i> +.
16.	£2 1 <i>s.</i> 10 <i>d.</i> +.
17.	£5 12 <i>s.</i> 9½ <i>d.</i> +.
18.	{ 4 <i>sacks</i> 5 <i>tods</i> 1 <i>stone</i> 5 <i>lb.</i> +.
19.	{ 1 <i>coom</i> 1 <i>strike</i> 2 <i>pk.</i> 3 <i>qt.</i> 1 <i>pt.</i> +.
20.	13 13 +.

CIRCULATING OR REPEATING DECIMALS.

ART. 164.

<i>Ex.</i>	<i>Ans.</i>
3.	Factors of den. $5 \times 5 \times 2$. decimal value .06.
4.	$37 \times 5 \times 2$. .0878+.
5.	$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5$. .034375.
6.	$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5$. .01328125.

ART. 165.

7.	$5 \times 5 \times 5 \times 2$. .028.
8.	$5 \times 5 \times 5 \times 5$. .0176.
9.	$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$. .1328125.

REDUCTION OF CIRCULATING DECIMALS.

ART. 175.

3.	$\frac{2}{3}, \frac{6}{37}, \frac{10}{13}, \frac{35}{37}, \frac{1}{11}$.
4.	$\frac{85}{143}, \frac{4}{11}, \frac{1}{7}$.

ART. 176.

4.	$\left\{ \frac{5}{36}, \frac{7269}{495}, \frac{29}{666}, \frac{3749}{90} \right\}$, $\left\{ \frac{223}{330}, \frac{15434}{66666} \right\}$.
5.	$\left\{ \frac{34}{45}, \frac{217}{495}, \frac{21}{225}, \frac{41256}{16665} \right\}$, $\left\{ \frac{163}{16500}, \frac{41}{90} \right\}$.

ART. 177. Sec. 2.

2.	$\left\{ \begin{array}{l} 2.4\overline{181818} +. \\ .5\overline{925925} +. \\ .008\overline{497133} +. \end{array} \right.$
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Sec. 4.

1.	$\left\{ \begin{array}{l} 165.16\overline{416416} +. \\ .04\overline{040404} +. \\ .03\overline{777777} +. \end{array} \right.$
2.	$\left\{ \begin{array}{l} .5\overline{333333} +. \\ .4\overline{757575} +. \\ 1.7\overline{577577} +. \end{array} \right.$

ART. 178.

2.	.1875.
3.	.00344827586206896551724137931'+.
4.	.09756'+. .592'+. .53+.

ADDITION OF CIRCULATING DECIMALS.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
2.	95.2 $\dot{8}29647' +$.	4.	55.6 $\dot{2}09780437503' +$.
3.	69.74 $\dot{2}03112' +$.	5.	47.4 $\dot{7}54481' +$.
6.	416.2 $\dot{5}42876131765090653986542876131765090653986' +$.		

SUBTRACTION OF CIRCULATING DECIMALS.

2.	45.7 $\dot{7}55' +$.	6.	4.37 $\dot{4} +$.
3.	2.9 $\dot{9}57' +$.	7.	4.619 $\dot{5}25' +$.
4.	5.09.	8.	1.0923 $\dot{7} +$.
5.	.65 $\dot{3}70016280906' +$.	9.	1.3462 $\dot{9}37' +$.

MULTIPLICATION OF CIRCULATING DECIMALS.

2.	5.53780 $\dot{5} +$.	7.	6.1 $\dot{6}56' +$.
3.	1.093 $\dot{0}86' +$.	8.	11.068735402 $\dot{2} +$.
4.	1.6411 $\dot{7} +$.	9.	.81654 $\dot{1}68350' +$.
5.	1.7183 $\dot{3}9' +$.	10.	189.301 $\dot{9}77' +$.
6.	1.4710 $\dot{0}37' +$.		

DIVISION OF CIRCULATING DECIMALS.

2.	13.570413 $\dot{9}61038' +$.	6.	3.1 $\dot{4}5' +$.
3.	35.024.	7.	3.8235294117647058 $\dot{8} +$.
4.	7.719 $\dot{5}4' +$.	8.	1.2 $\dot{6} +$.
5.	26.7837 $\dot{4}28571' +$.	9.	15.48 $\dot{4}23' +$.

RATIO AND PROPORTION OF NUMBERS.

ART. 183.		ART. 187.	
Ex.	Ans.	Ex.	Ans.
1.	2.	1.	$9 : 8 :: 18 : 16.$
2.	4.	2.	$51 : 17 :: 57 : 19.$
3.	4.	3.	$16 : 9 :: 48 : 27.$
4.	$1\frac{2}{11}.$	4.	$13 : 19 :: 52 : 76.$
5.	$\frac{1}{8}.$	5.	$16 : 21 :: 80 : 105.$
6.	$\frac{3}{10}.$	6.	$35 : 42 :: 210 : 252.$
7.	$\frac{1}{2}.$	7.	$37 : 29 :: 296 : 232.$
8.	$\frac{1}{3}.$	8.	$23 : 45 :: 207 : 405.$
9.	$\frac{1}{3}.$		
10.	$\frac{1}{10}.$	ART. 188.	
11.	$\frac{1}{25}.$	1.	6.
ART. 185.		2.	$\frac{1}{3}.$
1.	$3. 5. \frac{1}{2}. \frac{1}{5}. \frac{15}{16}.$	3.	$\frac{3}{16}.$

OF CANCELLING.

ART. 190.		ART. 191.	
3.	$51\frac{2}{3}.$	1.	$\frac{63}{312}.$
4.	11.	2.	27.
5.	9.	3.	1.
6.	$2\frac{1}{2}.$	4.	323.
7.	8.	5.	$15\frac{369}{385}.$
8.	12.	ART. 192.	
9.	12.	1.	$2 : 8 :: 1 : 4.$
10.	6.	2.	$2 : 7 :: 6 : 21.$
		3.	$5 : 12 :: 35 : 84.$

RULE OF THREE.

APPLICATIONS.		Ex.	Ans.
Ex.	Ans.	4.	3300lb.
1.	\$330.	5.	\$122,85.
2.	£9 6s. 8d.	6.	32 men.
3.	\$2762,50.		
7.	$8\frac{1}{2} = \frac{17}{2} : 4\frac{3}{4} = \frac{19}{4}.$ Both fill in 1 hour $\frac{1}{\frac{17}{2}} + \frac{1}{\frac{19}{4}} = \frac{2}{17} + \frac{4}{19} = \frac{106}{323}$ of the cistern. $\frac{106}{323} : 1 :: 1hr. : 3hr. 2m. 49\frac{1}{3}sec.$		
8.	16432 $\frac{1}{2}$ miles.	16.	£8 16s. 2 $\frac{3}{8}$ d.
9.	\$121,875.	17.	£1913 6s. 8d.
10.	160 days.	18.	6 $\frac{3}{4}$ oz.
11.	20 days.	19.	£1270 1s. 9 $\frac{1}{8}$ d.
12.	4200bu.	20.	\$80,64.
13.	£253 10s. $\frac{3}{4}$ d.	21.	£39637 10s.
14.	6oz. 15 $\frac{9}{16}$ dr.	22.	120 yards.
15.	£480 5s. 2 $\frac{1}{10}$ d.	23.	190 guineas.
24.	$\left\{ \begin{array}{l} \text{All will fill in 1 day } \frac{1}{24} + \frac{1}{32} - \frac{1}{48} = \frac{95}{1848} \\ \frac{95}{1848} : 1 :: 1da. : 19\frac{1}{8}da. \end{array} \right.$		
25.	\$37,80.	26.	108000.
27.	$\left\{ \begin{array}{l} \text{Rate 3mi. 1fur. } 18\frac{2}{11}rd. \text{ per hour.} \\ \text{Time 20hr. 21m. } 25\frac{1}{2}sec. \end{array} \right.$		
28.	$\left\{ \begin{array}{l} \text{A goes 11 yards per minute, or 33 yards in 3 minutes, while B goes 34 yards: hence, B gains 1 yard in 3 minutes; and to gain } \frac{536}{2} = 268 \text{ yards, he must travel} \\ 268 \times 3 = 804 \text{ minutes} \\ 3m. : 804m. :: 34yd. : 9112yd. \text{ distance travelled.} \\ 9112 \div 536 = 17 \text{ times round.} \end{array} \right.$		

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
29.	$4\frac{1}{2}$ days.	34.	£9 3s. 9d.
30.	54 days.	35.	$\left\{ \begin{array}{l} 35\frac{1}{2}\text{yd. baize.} \\ \text{cost 11s. 2d. } 1\frac{3}{4}\text{far.} \\ \text{per yard.} \end{array} \right.$
31.	13oz. per day.	36.	18 feet.
32.	$\left\{ \begin{array}{l} 588000\text{lb. total weight.} \\ 42000\text{lb. spoiled.} \end{array} \right.$	37.	8s. 2d. $3\frac{2}{3}\frac{4}{5}\frac{4}{7}\text{far.}$
33.	2018 <i>E. Fl.</i> 2qr.	38.	\$112,86.
39.			$\left\{ \begin{array}{l} \text{whole weight, 588000lb.} \\ \text{they received 546000lb.} \end{array} \right.$
40.			$\left\{ \begin{array}{l} \text{whole weight 9408000oz.} \\ 14\text{oz. per day.} \end{array} \right.$
41.	<p>1800 men consume $\frac{1}{4}$ of the provisions in 3 months, which is equal to $\frac{1}{12}$ in one month; in the next 4 months 1800 men consume $\frac{1}{3}$ of the whole, and 600 men $\frac{1}{6}$; $\frac{1}{3} + \frac{1}{6} = \frac{1}{2}$: $\frac{1}{4} + \frac{1}{6} = \frac{5}{12}$ = provisions consumed at the end of 7 months: $1 - \frac{5}{12} = \frac{7}{12}$ = provisions remaining: 2800 men consume $\frac{1}{10}$ of the whole provisions in one month. Hence,</p> <p>$\frac{1}{108} : \frac{1}{36} :: 1 \text{ month} : 2\frac{5}{14}\text{mo.}$ $7\text{mo.} + 2\frac{5}{14}\text{mo.} = 9\frac{5}{14}\text{mo. Ans.}$</p>		

RULE OF THREE BY ANALYSIS.

2.	87 miles.	13.	106yd. 2ft.
4.	\$78.	14.	$5\frac{1}{3}$ days.
5.	504 miles.	15.	27 days.
6.	\$2,08.	16.	1lb. 5oz. $9\frac{3}{4}\text{dr.}$
7.	\$24,75.	17.	40 weeks.
8.	\$380.	18.	64 bottles.
9.	\$0,429+.	19.	25yr. 202da. 2hr.
10.	30 days.	20.	He gained \$246,75.
11.	105 days.	21.	$67\frac{8}{11}\text{gal.}$
12.	8s.	22.	\$1,20.

RULE OF THREE BY CANCELLING.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
2.	8s. 8d.	12.	20 days.
3.	\$400.	13.	54 days.
4.	160 days.	14.	6 days.
5.	2700lb.	15.	12 days.
6.	4200 miles.	16.	4oz.
7.	\$12.	17.	3600.
8.	60 days.	18.	8½ yards.
9.	23352bu.	19.	16 months.
10.	£7 4s.	20.	121 yards.
11.	6d.	21.	228lb.

22. { 11d. : 2d. :: £225 10s. :: £41, D's part.
£225 10s. — £41 = £184 10s.
£184 10s. ÷ 3 = £61 10s. paid by each of the others.

EXAMPLES INVOLVING FRACTIONS.

2.	£1 18s. 6d.	11.	.005172 guineas. +
3.	£682 18s. 9d.	12.	.71428cwt. +
4.	£112 12s. 9½d.	13.	\$52.50.
5.	504E. Fl. 2qr.	14.	\$638.08+.
6.	£102 7s. 7d. +.	15.	£6206.933+.
7.	\$1.431⅔.	16.	£21 10s. 1½d.
8.	\$14.58½.	17.	62.734375 days.
9.	14 days.	18.	£77 3s. 7¼d.
10.	{ £1633 6s. 8d. (See Arith. Art. 20.)	19.	\$5.625.
		20.	40.646da. +
21.	{ .5 × .25 = .125 : .75 × ⅓ = .25 .25 : .125 :: 5400 : 2700.		
22.	6 persons in the family at first.	Ans.	293.28gals.
23.			114¾hrs.

*Ex.**Ans.*

24.

{ At the equator, 1038 $\frac{2}{3}$ $\frac{1}{2}$ miles.
 " Madras, &c. 1010 $\frac{2}{3}$ $\frac{1}{2}$ miles.
 " Madrid, " 794 $\frac{2}{3}$ $\frac{1}{2}$ miles.
 " Petersburg " 519 $\frac{1}{3}$ $\frac{1}{2}$ miles.

DOUBLE RULE OF THREE.

5.	72 acres.		<i>hrs.</i>	<i>hrs.</i>	<i>S. yd.</i>
6.	11676bu.		50	: 108	: : 70 × 3 × 2
7.	36 days.		<i>degrees</i>	<i>degrees.</i>	
8.	2808qrs.	14.	6	: 5	: : —
9.	168.		<i>men</i>	<i>men.</i>	
10.	50 men.		336	: 240	: : —
11.	10 days.	15.	<i>Ans.</i> 540 <i>S. yd.</i>		
12.	9600 men.	16.	36 <i>yd.</i> long.		
13.	14oz.	17.	1 <i>hour.</i>		
18.			27 <i>men.</i>		
19.			£11 2 $\frac{2}{3}$ <i>d.</i>		
			4da. 11hr. 54 $\frac{3}{4}$ <i>m.</i>		
			8571 $\frac{1}{2}$.		

	<i>yds.</i>		<i>yds.</i>	<i>days.</i>
	232 $\frac{1}{2}$ × 3 $\frac{3}{4}$ × 2 $\frac{1}{2}$:		337 $\frac{1}{2}$ × 5 $\frac{3}{4}$ × 3 $\frac{1}{2}$:	5 $\frac{1}{2}$
	<i>hrs.</i>		<i>hrs.</i>	
	9 :		11	—
20.	<i>degrees</i>		<i>degrees</i>	
	7 :		4	
	<i>men</i>		<i>men</i>	
	24 :		248	
	<i>Ans.</i> 132 <i>days.</i>			

PRACTICE.

13.	£91 1s. $\frac{2}{3}$ <i>d.</i>	17.	\$2,70.
14.	£44 9s. 8 $\frac{1}{4}$ <i>d.</i>	18.	\$1,575.
15.	£38 3s. 3 $\frac{1}{2}$ <i>d.</i>	19.	\$547,50.
16.	£19 1s. 3 $\frac{1}{2}$ <i>d.</i>	20.	\$5.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
21.	\$108.	36.	\$1854.
22.	£142 16s. $5\frac{6}{8}d.$	37.	£458 $5\frac{3}{8}d.$
23.	£10 15s. $2\frac{3}{5}d.$	38.	£199 1s. $10\frac{1}{8}d.$
24.	£18 7s. $6\frac{7}{16}d.$	39.	\$1095.
25.	£3 7s. $5\frac{5}{8}d.$	40.	\$7.
26.	£2051 13s. $10\frac{5}{25}d.$	41.	\$8,10.
27.	\$812,25.	42.	£69 2s. $3\frac{1}{2}d.$
28.	\$1617.	43.	£550 11s. $10\frac{1}{2}d.$
29.	\$643,75.	44.	£661 17s. $3\frac{3}{4}d.$
30.	\$519,75.	45.	£445 5s. $4\frac{7}{8}d.$
31.	£1877 10s. $9\frac{3}{16}d.$	46.	\$65,90625.
32.	£233 5s. $11\frac{1}{4}d.$	47.	\$564.
33.	£348 14s. $11\frac{1}{4}d.$	48.	\$148,2890625.
34.	\$135,375.	49.	\$48,91796875.
35.	\$15.		

TARE AND TRET.

1.	65cwt. 1qr. 19lb.	6.	\$808,71.
2.	4cwt. 1qr. 15lb. 8oz.	7.	£912 14s. $5\frac{1}{4}d.$
3.	{ 1T. 13cwt. 2qr. 18lb. 10oz. 3,84dr.	8.	6T. 16cwt. 3qr. 20lb.
4.	\$265,16.	9.	3T. 8cwt. 3qr. 5lb.
5.	£59 4s. $3\frac{2}{8}d.$	10.	{ 6T. 12cwt. 3qr. $3\frac{1}{2}lb.$ Value, \$306,7246875.
11.			{ In leaf, \$26,0586 + per cwt. In rolls, \$29,5504 + " "
12.			{ Net weight, 161cwt. 1qr. 8.961lb. + Value, \$1177,709 +.
13.			{ Net weight, 100cwt. 1qr. $9\frac{1}{2}lb.$ Value, \$752,511 +.
14.			{ Net weight, 27cwt. 2qr. $6\frac{1}{8}lb.$ Value, \$232.837 +.
15.			{ Net weight, 10cwt. $27\frac{1}{2}lb.$ Value, \$4,0417 +.

*Ex.**Ans.*

16. $\left\{ \begin{array}{l} \text{Net weight, 20cwt. 2qr. 13} \frac{1}{2} \text{lb.} \\ \text{358.312gal.} + \\ \text{Freight, \$444,306} +. \end{array} \right.$
17. $\left\{ \begin{array}{l} \text{Net weight, 298cwt. 2qr. 23,454lb.} + \\ \text{Freight, \$355,464} +. \end{array} \right.$

SIMPLE INTEREST.

ART. 204.

4. \$1205,9208.
5. \$803,25.
6. \$450,32760.
7. \$4853,844.
8. \$643,83375.
9. \$1277,2971.
10. \$235,764.
11. \$1205,9208.
12. \$1375,8144.
13. \$12959,584.
14. \$1130,85.

ART. 205.

3. \$1225,511.
4. \$44,20845.
5. \$6015,4272.
6. \$357,9165.
7. \$2147,499.
8. \$270,5175.
9. \$2953,22685.
10. \$7765,4504.
11. \$1578,6625.
12. \$86388,7905.

ART. 207.

3. $\left\{ \begin{array}{l} \$3,2727875. \\ \$145,1545. \end{array} \right.$
4. \$67,278.
5. \$5,56529 +.
6. \$0,4314 +.
7. \$11,4555.
8. \$1,13559.
9. \$13,68.
10. \$31,928125.
11. \$121,77275.
12. \$2,27721 +.
13. \$609,45776.

ART. 209.

2. \$16474,3855 +.
3. \$1449,70998.
4. \$371,86875.
5. \$14056,0442.
6. \$266,277.
7. \$14096,5 +.
8. \$4479,618.
9. \$1149,552.
10. \$527,1746 +.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>		
11.	\$40900,9335.	11.	\$587,6311+.		
12.	\$6418,50195.	12.	\$3974,5187+.		
ART. 210.		13.	\$3329,1468+.		
3.	\$511,5357.	14.	\$1137,0592+.		
4.	\$167,30.	15.	\$7,3932+.		
5.	\$1025,86295.	16.	\$678,2599+.		
6.	\$555,465.	17.	\$4824,2366+.		
7.	\$4200.	ART. 211.			
8.	\$2643,8386.	3.	\$43,2049+.		
9.	\$7,00.	4.	\$8,1855.		
10.	\$311,45985.	<div>Int. at 4 per cent, \$45,837.</div> <div>" 5 " " \$57,29625.</div> <div>" 5½ " " \$63,025875.</div> <div>" 6 " " \$68,7555.</div> <div>" 7 " " \$80,21475.</div> <div>" 7½ " " \$85,944375.</div> <div>" 8 " " \$91,674.</div> <div>" 8½ " " \$97,403625.</div> <div>" 9 " " \$103,13325.</div>			
5.					
6.	\$47,716.			9.	£68 5s. 10d.+.
7.	\$380,28952.			ART. 213.	
8.	\$669,7096875.			1.	\$394,3256+.
9.	\$25571,2473+.			2.	\$697,986.
ART. 212.		3.	\$3339,6+.		
2.	£45 8s. 1¾d.+	4.	\$823,9024+.		
3.	£49 16s. 6¾d.+	5.	\$4640,5326.		
4.	£45 10s. 2d.+	6.	\$1976,6305+.		
5.	£662 3s.+	ART. 214.			
6.	£216 1s. 10¼d.+	2.	\$5359,363+.		
7.	£219 18s. 0¼d.+	3.	\$8921,618+.		
8.	£199 6s. 3¾d.+	4.	\$1123,865+.		

ART. 217.		Ex.	Ans.
Ex.	Ans.	3.	\$575,569+.
2.	\$3976,848+.	4.	\$1424,849+.
5.	The principal is \$347,24+ at all the rates.		
ART. 218.		ART. 219.	
2.	5 per cent.	2.	2yr. 6mo.

REDUCTION OF CURRENCIES.

3.	£1073 18s. 1½d.	5.	£4881 12s. 9½d.+.
4.	\$1967,892+	6.	\$2551,733+.

COMPOUND INTEREST.

ART. 220.		ART. 221.	
2.	\$57,3048+.	2.	\$578,740+.
3.	\$73,015+.	3.	\$8611,128+.
4.	\$41,216+.	4.	\$2364,903+.
5.	\$861,668+.	5.	\$7058,617+.
6.	\$48165,938+.	6.	\$2647,996+.
7.	\$14523,553+.	7.	£11 18s. 11d.+.
		8.	\$9974,685+.

PERCENTAGE.

ART. 223.		8.	742gal. 3qt. 3½gi.
1.	\$42,60.	ART. 224.	
2.	432bar.	1.	15½ per cent.
3.	42hhd.	2.	55 per cent.
4.	\$10,80.	3.	20 " "
5.	\$24,25.	4.	20 " "
6.	\$3,745+.	5.	16½ " "
7.	205 boxes.		

LOSS AND GAIN.

ART. 225.		Ex.	Ans.
Ex.	Ans.	6.	\$1,06½.
3.	Loss of \$0,75.	7.	\$337,50.
4.	\$0,966+.	8.	\$217,50.
		9.	\$4,108.
ART. 227.		10.	25 per cent.
1.	\$1,6470½.	11.	£18 15s.
2.	12 per cent.	12.	{ Whole gain, \$13,00.
3.	\$1,25.		{ Gain, 20 per cent.
4.	\$1,20.	13.	\$2,05.
5.	\$6,33½.	14.	\$1,031½.

COMMISSION AND BROKERAGE.

2.		\$49725.
4.		\$5882,352+.
5.	{ Amount of stock, 7253,886+ Brokerage ¼ per cent, 18,134+ \$7235,752+.	
6.	{ Amount of stock, 7834,101+ Brokerage ¼ per cent, 19,585+ \$7814,516+.	
7.	15 tons.	13. \$25420,195.
8.	\$213532,50.	14. \$7935.
9.	\$28606,965+.	15. \$965,30.
10.	\$59110.	16. \$1995.
11.	\$46260.	17. \$18573,56.
12.	\$23700.	18. { 149T. 18cwt. 2qr. 12lb. 6oz. 1½dr.

BANK DISCOUNT.

ART. 239.		ART. 240.	
<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
1.	\$10,50.	2.	\$344,59+.
2.	\$15240,54.	3.	\$5734,32+.
3.	\$5,840+.	4.	\$695,75+.
4.	\$62,496.	5.	\$118,73+.
5.	\$29,0097+.	6.	\$1508,177+.
6.	\$120,617+.	7.	\$1740,61+.
		8.	\$1057,51+.

DISCOUNT.

2.	\$1551,918+.	9.	I make £123 15s. 8½d.
3.	£33 17s. 7¾d.+.	10.	\$3869,407+.
4.	\$9677,507+.	11.	1bu. 2½qts.
5.	£223 5s. 8d.+.	12.	\$2109,236+.
6.	\$5620,175+.	13.	\$2763,694+.
7.	\$702,485+.	14.	\$4000.
8.	£804 19s. 5d.+.	15.	He lost \$6,473+.

INSURANCE.

2.	\$5168,59.		\$1057,50.
3.	{ \$237,60.		\$940.
	{ \$158,40.		\$705.
	{ \$252.	5.	\$352,50.
	{ \$126.		\$235.
4.	{ \$84.		\$117,50.
	{ \$56.		\$94.
	{ \$42.		\$78,33½.
6.			\$504.
7.			\$39,375.
8.			\$306,25.
9.			\$450.
10.			\$1320.
11.			\$18,75.

ASSESSING TAXES.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
2.	.4685 + <i>per cent.</i>	3.	\$37901125.

EQUATION OF PAYMENTS.

2.	12 months.	9.	Sept. 1st.
3.	8mo. 22 $\frac{4}{3}$ da.	10.	6mo. 6da.
4.	9 months.	11.	7mo. 3da.
5.	68 $\frac{22}{31}$ days.	12.	Jan. 25th.
6.	8 $\frac{3}{4}$ months.	13.	8mo. 10da.
7.	67 $\frac{6}{19}$ days.	14.	Dec. 28th.

PARTNERSHIP OR FELLOWSHIP.

2.	{ A's share, \$1714,285+. B's share, \$285,714+.	4.	{ A's share, \$5000. B's " \$2500. C's " \$3333,33+. D's " \$2500. E's " \$6666,67+.
3.	{ A's share, £4030. B's share, £3980. C's share, £3980. D's share, £4010.		

DOUBLE FELLOWSHIP.

2.	{ A's share, £9 12s. B's share, £14 8s.	2.	{ A paid \$3000. B " \$3000. C " \$9000. A's gain, \$250. B's " \$250. C's " \$750.
3.	{ C, £23 5s. 9d. D, £30 14s. 3d.		

GENERAL EXAMPLES IN FELLOWSHIP.

1.	{ 75 cents on the dollar. A's part, \$375,27 $\frac{3}{4}$. B's " \$171. C's " \$968,42 $\frac{1}{4}$. D's " \$532,05.	3.	{ 1st son's share, \$3333,33 $\frac{1}{3}$. 2d " \$3000. 3d " \$3000. 4th " \$2666,66 $\frac{2}{3}$.
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Ex.

Ans.

4. $\left\{ \begin{array}{l} 4500-1125 : 2250 :: 1125 : 750 \text{ widow's gain.} \\ 4500-1125 : 1125 :: 1125 : 375 \text{ younger son's gain.} \end{array} \right.$
 Widow's share, \$3000.
 Younger son's share, \$1500.
5. $\left\{ \begin{array}{l} 13\frac{1}{2} = \text{No. of prem. of first grade that } \$12 \text{ will buy.} \\ \text{Value of 1 premium of 1st grade } \$0,88\frac{3}{8}. \\ \text{" 1 " 2d " } \$0,44\frac{1}{8}. \\ \text{" 1 " 3d " } \$0,22\frac{1}{8}. \end{array} \right.$
6. $\left\{ \begin{array}{l} \text{A's loss, } \$46,526+. \\ \text{B's " } \$130,273+. \\ \text{C's " } \$238,213+. \\ \text{D's " } \$334,988+. \end{array} \right. \quad 7. \quad \left\{ \begin{array}{l} \text{A's share, } \$36. \\ \text{B's share, } \$28. \end{array} \right.$

ALLIGATION MEDIAL.

2. \$0,84375. | 4. $20\frac{2}{3}$ carats.
 3. \$0,28 $\frac{2}{3}$. | 5. 730.

ALLIGATION ALTERNATE.

ART. 252.

2. $\left\{ \begin{array}{l} 2\text{lb. at } 8\text{cts.} \\ 2\text{lb. at } 10\text{cts.} \\ 6\text{lb. at } 14\text{cts.} \end{array} \right.$
3. $\left\{ \begin{array}{l} 3 \text{ parts of } 16 \text{ carats.} \\ 2 \text{ " of } 18 \text{ " } \\ 3 \text{ " of } 23 \text{ " } \\ 5 \text{ " of } 24 \text{ " } \end{array} \right.$

3. $\left\{ \begin{array}{l} 12\text{bu. of oats.} \\ 12\text{bu. of barley.} \\ 12\text{bu. of rye.} \\ 96\text{bu. of wheat.} \end{array} \right.$
4. $\left\{ \begin{array}{l} 32\text{gal. of spirits.} \\ 32\text{gal. of Eng. brandy.} \\ 40\text{gal. of French do.} \end{array} \right.$

ART. 254.

4. $\left\{ \begin{array}{l} 6\text{gal. at } 10\text{s.} \\ 3\text{gal. at } 14\text{s.} \\ 4\text{gal. at } 21\text{s.} \\ 8\text{gal. at } 24\text{s.} \end{array} \right.$

2. $\left\{ \begin{array}{l} 29\text{lb. at } 5\text{s.} \\ 14\frac{1}{2} \text{ at } 6\text{s.} \\ 14\frac{1}{2} \text{ at } 8\text{s.} \\ 29 \text{ at } 9\text{s.} \end{array} \right.$
3. $\left\{ \begin{array}{l} 45\text{gal. at } 4\text{s.} \\ 5\text{gal. at } 6\text{s.} \\ 5\text{gal. at } 8\text{s.} \\ 5\text{gal. at } 10\text{s.} \end{array} \right.$

ART. 253.

2. $\left\{ \begin{array}{l} 28\text{bu. of oats.} \\ 4\text{bu. of barley.} \\ 8\text{bu. of rye.} \\ 14\text{bu. of wheat.} \end{array} \right.$

4. $\left\{ \begin{array}{l} 30\text{oz. of } 15 \text{ carats.} \\ 4\text{oz. of } 20 \text{ " } \\ 4\text{oz. of } 22 \text{ " } \\ 4\text{oz. of } 24 \text{ " } \end{array} \right.$

CUSTOM HOUSE BUSINESS.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
1.	\$2812,5.	4.	\$1442,875.
2.	\$418,068.	5.	{ Tare 2508 <i>lb.</i> Duty \$76,095.
3.	\$351,45+.		

TONNAGE OF VESSELS.

1.	225 $\frac{9}{19}$ tons.	4.	300.14 tons+.
2.	438.59 tons+.	5.	738.15 tons+.
3.	729 $\frac{97}{855}$ tons.		

GAUGING.

ART. 267.		2.	162.613 beer gal.+.
2.	32.4938in.	3.	{ 136.06 wine gal.+. 112.051 beer gal.+.
3.	28.1010in.	4.	
ART. 268.			
1.	197.459 wine gal.+.		

LIFE INSURANCE.

2.	\$144.	3.	\$189,55.
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ENDOWMENTS AND ANNUITIES.

1.	{ \$376,84 : \$859,61 :: \$100 : \$228,11+. Ans. \$228,11+.
2.	{ \$100 : \$3150 :: \$1685,20 : \$53083,80. Ans. \$53083,80.

EXCHANGE.

ART. 293.		ART. 294.	
1.	\$8591,975.	1.	\$5630,065.
2.	\$8637,168+.	2.	\$176204,472+.
3.	\$9777,636.	3.	£14014 18 <i>s.</i> 2 <i>d.</i> +.

<i>Ex.</i>	<i>Ans.</i>	<i>Ex.</i>	<i>Ans.</i>
4.	\$6005,368+.	4.	84597 francs 66 centimes.
5.	\$807,873+.		
	ART. 295.		ART. 296.
2.	7 per cent* above par.	1.	\$6657,693.
3.	\$12286,06074.	2.	{ \$1250,52, 3 per cent* nearly below par.

DUODECIMALS.

	ART. 301.	5.	36ft. 4' 6'' 5'''.
1.	15ft. 5'.	6.	22ft. 2' 1'' 10'''.
2.	1ft. 8' 10''.		ART. 303.
3.	2ft. 6' 3'' 11'''.	3.	214ft. 1' 1'' 6'''.
4.	5ft. 10' 7''.	4.	87ft. 1'.
EXAMPLES IN ADDITION AND SUBTRACTION.		5.	232ft. 2' 8''.
1.	5ft. 8' 2'' 1'''.	6.	866ft. 8' 3''.
2.	15ft. 4' 10'' 4'''.	7.	2 cords 5 cord feet.
3.	1ft. 11' 10'' 11'''.	8.	57ft. 4' 6''.
4.	21ft. 6' 5'' 5'''.	9.	46 cord ft. 14S. ft.
		10.	185ft. 6' 4'' 3'''.

INVOLUTION.

1.	1953125.	9.	$\frac{27}{84}$.
2.	343.	10.	.0001.
3.	3600.	11.	37.4544.
4.	625.	12.	1000000.
5.	1889568.	13.	$34\frac{21}{84}$.
6.	1.	14.	1679616.
7.	$\frac{1}{4}$.	15.	666024768837.
8.	.001.		

* The percentage is estimated upon the custom house value.

EXTRACTION OF THE SQUARE ROOT.

ART. 309.		Ex.	Ans.
Ex.	Ans.	6.	.0321.
3.	462.	7.	2.104.
4.	1506.23+.	8.	6.906.
5.	3897.89+.		
6.	6031.	ART. 311.	
7.	4698.	1.	.5236+.
ART. 310.		2.	$\frac{4}{5}$.
2.	57.19+.	3.	.4203+.
3.	69.247+.	4.	1.0682+.
4.	2.091+.	5.	.86602+.
5.	.01809+.	6.	.93309+.

EXTRACTION OF THE CUBE ROOT.

ART. 313.		4.	4.218+.
2.	73.	5.	.707.
3.	179.	6.	1.505.
4.	319.	7.	3.026.
5.	439.	ART. 315.	
6.	638.	1.	$\frac{5}{7}$.
7.	364.	2.	$2\frac{1}{3}$.
8.	3002.	3.	$3\frac{1}{3}$.
ART. 314.		4.	$\frac{3}{8}$.
1.	.5032+.	5.	.829+.
2.	.955.	6.	.822+.
3.	2.35.	7.	873+.

ARITHMETICAL PROGRESSION.

ART. 318.		Ex.	Ans.
Ex.	Ans.	3.	{ Last term 34.
2.	\$1,53.		{ Sum 162.
3.	\$205.	4.	5 miles 1300 yards.

GENERAL EXAMPLES.

ART. 319.		1.	89.
2.	4 years.	2.	4.
3.	5 miles.	3.	26ft. 6in.
ART. 320.		4.	\$4.
2.	78.	5.	{ 3 miles each day.
			{ 100 " in all.

6. { If we multiply the common difference 5, by one less than the number of terms, 21, the product will be 105, which is the last term minus the first term, and consequently is less than the sum of the extremes by double the first term. Multiply 105 by half the number of terms, 11, and the product is 1155, which being subtracted from 1221 the sum of the terms, leaves 66 which is twice 11 times greater than the first term; hence, the first term is 3.
7. { Ans. 3.
Ans. \$272.

GEOMETRICAL PROGRESSION.

ART. 322.		ART. 323.	
2.	£2 2s. 8d.	2.	£204 15s.
3.	£25600.	3.	\$196,83.
4.	\$61,44.	4.	\$295,24.
			\$9450.

PROMISCUOUS QUESTIONS.

1.	\$1853,181+.	4.	4 years.
2.	57 pieces.	5.	\$10000.
3.	12wk. 3 $\frac{1}{4}$ da.		

6. If we knew the share of the fourth, we could find the share of the third by adding \$1175 to this sum; the share of the second would be the share of the fourth + \$1175 + \$1700; and the share of the first would be the share of the fourth + \$1175 + \$1700 + \$4250; and the sum of these four shares would be the whole gain, \$21175. By subtracting the sum total of the sums added to the share of the fourth partner to find the share of each of the others, from the whole gain, the remainder would be four times the share of the fourth partner.

Thus, whole gain \$21175 — \$11175 = \$10000;

\$10000 ÷ 4 = \$2500 = 4th partner's share;

\$2500 + \$1175 = \$3675 = 3d " "

\$3675 + \$1700 = \$5375 = 2d " "

\$5375 + \$4250 = \$9625 = 1st " "

7. If the numbers were equal, each would be half the sum, but as one is greater than the other, the greater will be half the sum added to half the difference, and the less half the difference subtracted from half the sum.

Ans. { Greater number, 3664½.
Less " 1665½.

8. Ans. 46yr. 11mo. 20da. 10½hr.

9. Subtracting the 80 yards from the 140 yards will leave 60 yards, twice which, or 120 yards, is the quantity he had in the store at first.
Ans. 120 yards.

10. Ans. 9mi. 5fur. 34rd. 3yds.

11. Ans. \$31,25.

12. \$7180 — \$420 = \$6760 = price he would have paid.
\$6760 + \$130 = \$6890 = price actually paid.

13. Ans. \$454,9375.

14. Ans. 23599680 cubic yards.

15. Ans. 176.

16. The time past midnight is equal to the time past noon plus 12 hours. The time from midnight to noon, 12 hours, is four-fifths of the whole time. Therefore, the time past noon is 3 hours.
Ans. 3 o'clock.

$$17. \quad 9 \times 25 = 225 \text{ dividend;} \\ 225 - 85 = 140. \quad \text{Ans. 140.}$$

$$18. \quad \text{Ans. } \begin{cases} \text{The second } 6\frac{2}{3} \text{ days after the third.} \\ \text{The first } 5\frac{1}{10} \text{ days after the second.} \end{cases}$$

$$19. \quad \text{Ans. } \$4646, 36+.$$

$$20. \quad \text{Ans. } \begin{cases} \text{Time, } 10\text{yr. } 19\frac{2}{3}\frac{2}{3}\text{da.} \\ \text{Cost, } \$37564, 56. \end{cases}$$

$$21. \quad \begin{cases} 1 - (\frac{1}{2} + \frac{1}{6} + \frac{1}{10}) = \frac{1}{6} = 4000 \\ 4000 \div 16 = 250; \\ 250 \times 30 = 7500. \end{cases} \quad \text{Ans. 7500 men.}$$

$$22. \quad \begin{cases} £1.12 : £1 :: £176 \text{ 8s.} : \text{Ans.} \\ \text{Ans. } £157 \text{ 10s.} \end{cases}$$

$$23. \quad \text{Ans. 4 days.}$$

24. As D's gain is to the gain of either of the others, so is the product of his stock and time, to the product of the stock and time of either of them.

$$\text{Ans. } \begin{cases} \text{A's stock } £304 \text{ 16s.} \\ \text{B's " } £276. \\ \text{C's " } £210. \end{cases}$$

25. As the product of C's stock and time, is to the product of A's or B's stock and time, so is C's gain to A's or B's gain.

$$\text{Ans. } \begin{cases} \text{A's gain, } \$276,5625. \\ \text{B's " } \$322,65625. \\ \text{Whole " } \$746,71875. \end{cases}$$

$$26. \quad 14 : \left\{ \begin{array}{c} 3 \\ 4 \\ 7 \end{array} \right\} :: 292\text{gal.} : \text{Ans.}$$

$$\text{Ans. } \begin{cases} 62\frac{4}{7}\text{gal. of the 1st kind.} \\ 83\frac{3}{7} \text{ " " 2d " } \\ 146 \text{ " " 3d " } \end{cases}$$

$$27. \quad \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} : \left\{ \begin{array}{c} \frac{1}{2} \\ \frac{1}{3} \\ \frac{1}{4} \\ \frac{1}{5} \end{array} \right\} : £500 : \text{Ans.}$$

$$\text{Ans. } \begin{cases} \text{A's share, } £194 \text{ 16s. } 11\frac{1}{2}\text{d.} \\ \text{B's " } £129 \text{ 17s. } 4\frac{1}{2}\text{d.} \\ \text{C's " } £97 \text{ 8s. } 0\frac{1}{2}\text{d.} \\ \text{D's " } £77 \text{ 18s. } 5\frac{1}{2}\text{d.} \end{cases}$$

28. As the whole stock and gain is to each one's stock and gain, so is the whole gain, to each one's share.

Whole stock and gain $\$1600 + 300 = \1900 .

$\$1900 - \$1140 = \$760$ stock and gain of first.

Ans. $\left\{ \begin{array}{l} \text{Gain of 1st, } \$120. \\ \text{" 2d, } \$180. \end{array} \right.$

29. *Ans.* $108\frac{7}{8}$.

30. *Ans.* 4 hhd. 19 gal. $3\frac{1}{2}$ qt.

31. *Ans.* 10 hours.

32. *Ans.* $\$1,75$.

33. $\$1,853+$.

34. *Ans.* $44\frac{4}{5}$.

35. $\$1,00-.09 : \$1,00 :: \$3014,30 : \text{Ans.}$

Ans. $\$3312,417+$.

36. *Ans.* $\left\{ \begin{array}{l} 130\frac{1}{2} \text{ yards of cloth.} \\ \text{Price of linen per yard, } \$0,58\frac{1}{2}. \end{array} \right.$

37. *Ans.* $\$42,34\frac{1}{2}$.

38. *Ans.* 4 yards.

39. *Ans.* 12 cwt. 16 lb. 15 oz.

40. *Ans.* $.0502+ = \text{rate per cent reduced to decimals.}$

41. *Ans.* 4 yr. 11 mo. $27\frac{1}{2}\frac{1}{2}$ da.

42. The interest for 7 years at 5 per cent will be .35 of the principal. The amount, being the sum of the principal and interest, will be 135 hundredths or 1.35: hence, as

$1.35 : 1 :: \$2327,89 : \text{principal.}$

Ans. $\$1724,363+$.

43. *Ans.* 356,25.

44. *Ans.* $\left\{ \begin{array}{l} 8s. 9d. : 10s. 6d. :: 1.12 : 1.34\frac{1}{2}. \\ \text{Ans. } 34\frac{1}{2} \text{ per cent.} \end{array} \right.$

45. *Ans.* $\left\{ \begin{array}{l} \text{It cost } 9s. \text{ per lb.} \\ \text{Damaged tea was sold for } 8s. \text{ per lb.} \end{array} \right.$

46. It was sold per yard for $\$5,66\frac{2}{3}$. An E. E. is $\frac{5}{4}$ yards. Hence, the first cost per yard, will be equal to $\$5,66\frac{2}{3}$, less the cost of $\frac{1}{4}$ of $\frac{5}{4}$ yards $= \frac{5}{32}$ yards. Therefore, the first cost, per yard, is found by dividing $\$5,66\frac{2}{3}$ by 1 yard plus $\frac{5}{32}$ yards $= \frac{37}{32}$ yards. The cost per yard is $\$4,90\frac{10}{11}$, and the entire cost $\$18378.37\frac{3}{4}$.

$$47. \quad \left\{ \begin{array}{l} \$1,12 : \$1 :: \$9676,80 : \text{Ans.} \\ \text{Ans. } \$8640. \end{array} \right.$$

$$48. \quad \text{Ans.} \left\{ \begin{array}{l} 1 + 3 + 1\frac{1}{2} \times (1 + 3) = 10; \$9202 \div 10 = \\ \$920,20 = \text{what the 1st gave.} \\ \$2760,60 = \quad \quad \quad 2d \quad \quad \quad \\ \$5521,20 = \quad \quad \quad 3d \quad \quad \quad \end{array} \right.$$

$$49. \quad \text{Ans.} \left\{ \begin{array}{l} \$86 \div 3 = \$28\frac{2}{3} \text{ amt. paid each workman.} \\ \text{1st company cleared, } 87\frac{3}{4} \text{ acres.} \\ 2d \quad \quad \quad \quad \quad \quad \quad 77\frac{1}{4} \quad \quad \quad \\ \text{cost of clearing, } \$8\frac{8}{9} \text{ per acre.} \end{array} \right.$$

$$50. \quad \text{Ans. 15 and 11.}$$

51. In 1 minute the pipe brings in $\frac{1}{9}$ gal. The tap discharges in 1 minute $\frac{4}{9}$ gal. Hence it fills in 1 minute $\frac{1}{9} - \frac{4}{9} = -\frac{3}{9}$ gal. It so runs for 3 hours = 180 minutes: hence it fills in that time $\frac{7}{9} \times 180 = 140$ gal.

It has then to fill $147 - 140 = 7$ gal.

$$\begin{array}{ccc} \text{gal.} & \text{gal.} & \text{m.} \\ 14 & : 7 & : : 9 : \text{Ans.} \end{array}$$

$$\text{Ans.} \left\{ \begin{array}{l} \text{It fills 63m. } 48\frac{1}{4} \text{ sec. after 5 o'clock, or at 6 o'clock} \\ 3m. } 48\frac{1}{4} \text{ sec.} \end{array} \right.$$

52. It is evident that the officer gains on the thief at the rate of 2 miles per hour. As the thief has 40 miles the start, he must gain 40 miles, which will take 20 hours: hence he travels $20 \times 7 = 140$ miles.

53. The share of the fifth is \$1825; this being subtracted from \$20000 leaves \$18175 for the others. The proportional part of the gain of each, corresponds to the sum of his partial products: that of the first is 43280; of the second, 104400; of the third, 103200; of the fourth, 138600.

$$\text{Ans.} \left\{ \begin{array}{l} \text{Share of the 1st, } \$2019,651+. \\ \quad \quad \quad \quad \quad \quad \quad 2d, \$4871,803+. \\ \quad \quad \quad \quad \quad \quad \quad 3d, \$4815,805+. \\ \quad \quad \quad \quad \quad \quad \quad 4th, \$6467,739+. \\ \quad \quad \quad \quad \quad \quad \quad 5th, \$1825. \end{array} \right.$$

54. The traveller from New Haven travels 8 hours at 3 miles an hour before the other starts: hence, he has advanced $8 \times 3 = 24$ miles. At 4 in the afternoon they are

130 — 24 = 106 miles apart. Now, they approach each other at the rate of 7 miles an hour; they therefore meet in $15\frac{1}{7} = 15\frac{1}{7}$ hours.

The first has travelled - - . 24 miles

Also, $15\frac{1}{7} \times 7$ - - - - $45\frac{3}{7}$ "
69 $\frac{3}{7}$ miles.

Ans. $69\frac{3}{7}$ miles from New Haven.

55.

Ans. $\left\{ \begin{array}{l} 69\frac{10}{11} \text{ days.} \\ \$3907,75. \end{array} \right.$

58.

Ans. 5hr. 41m. 20sec.

THE END.

